

SUMMARY  
THREE SUBGROUPS VEGETATION THEME MEETING  
June 5, 2000

---

*Methodology Sub-Group*  
*June 5, 2000 SCC Vegetation Theme Team*

Group: John Menke, Brian Schwind, Doug Cribbs,  
John Willoughby, Mehrey Vaghti, Neil Sugihara

Vegetation Mapping:

Scale considerations (what are the most useful scales?):

- Requires a user needs assessment
- what value exists
- what more do you get
- These are not competing methodologies They each have their own specific uses.

Suggest a Three-tiered approach: All three tiered to a hierarchical classification

- Small scale – CDF-USFS 5 year Maintenance
- Mid scale – DOQQ-based 10 year Maintenance
- Fine Scale Ground – large scale photo irregularly updated

Classification:

- Must be defined first
- Floristic view versus habitat or community view.
- Data collection effort can be independent of map
- Must feed up and nest within upper levels of hierarchy. e.g., coarse scale (Riversidean coastal sage scrub) interim scale (white sage-Encelia-Eriogonum fasciculatum – south-facing superalliance; fine scale (White sage alliance, or white sage-Encelia association)
- Define levels of scale and appropriate uses of hierarchy
- Delineations relate classification to what can be perceived
- Labels in some cases based on compromise between what can be discerned remotely and from field data

Move toward national system – TNC

- May involve interim levels of hierarchy such as “super-alliance”
- Standardized system for adding vegetation types as identified

Funding and Support:

- Must demonstrate need for chosen scale
- Might be difficult to sell two scales – should an intermediate be chosen?? Discuss the virtues of two scales based on business needs assessment (cost of methods and value to users)

Integrating Between scales: Salient Points

- Use coarse level mapping to facilitate fine scale efforts when available and visa versa
- Need feedback mechanism – group feedback- for feeding in updates and improvements
- Need leveling filter mechanism

#### Quality Review- Peer Review

- Give professional/peers an avenue to participate
- Possible upload data on Web site (after in house quality control)
- General public review should not occur until Baseline is established.
- Make available to professional organization for peer review before final product –
- Annual 1- year cycle
- Establish a central office to assure coordination, consistency, filter for public updates

#### Justification for finer scale mapping

- a. how it feeds up to coarse scale
- b. why it is important to have a mid scale

#### Other Ideas:

Establish biophysical data map layer to assist with attribution (see existing data group)  
Include soils, slope, aspect, precipitation

We need to resolve the inherent scale of mapping methodologies

### ***Existing Information Subgroup***

Participants: Todd Keeler-Wolf (coordinator), Ralph Warbington, Cynthia Roye, Carrie Shaw, Jeff Milliken, Barry Garrison, Hazel Gordon \*

Our small group discussed existing data in terms of (1) historical data sources, (2) status of crosswalks to various classification systems, (3) plot or field data, (4) status and acquisition of basic imagery and elevation information and (5) general questions about the role of the CBC and “standards” in general

#### **Historical Data Sources**

1. Weislander Maps, potentially valuable source for trend analysis: These are at 1:62,000, covering about 60% of the state. Jeff Milliken (BOR) should communicate with Mike Hoover (US Fish & Wildlife) to assess how many have already been digitized. Hard copies (bluelines) are retained by Barbara Allen-Diaz at UC Berkeley. Major problem is in georeferencing these maps, as demonstrated in the Sierra Nevada project.
2. Older timber type and Weislander type maps exist, including a 1946 synthesized version of Weislander and a 1934 map that has been digitized at RSL and which includes categories such as types of forested lands, grazing lands, etc.
3. Kuckler map of potential natural vegetation of California, 1977, available online from CDF/RSL, plotted at about 1:1,000,000
4. Calveg: first map of entire state's existing vegetation at 1:1,000,000 available online from RSL
5. Soil-vegetation surveys done for individual national forests in the 1950s and 1960s; generally have not been digitized except for Mendocino NF. Include soil survey information and species information.
6. Timber type maps generated on national forests from photo interpretation. Generally available as mylars overlain on 7.5' or 15' topo maps; used for forest management plans of the 1970s and occasionally updated by individual forests. Some data such as structural attributes for forest types is potentially useful.
7. Calif. Dept. of Conservation crop maps are updated every two years and includes intensive agric. Areas such as Imperial and Central Valleys. The Farmland Mapping Project distinguishes active and perennial agriculture crops from less active land uses.
8. Calif. Dept. of Water Resources maintains agriculture maps by county, which are updated on 5-8 year cycles and ground-truthed in all areas mapped. Identifies categories of crops at a particular time but does not capture crop rotation information.
9. U.S. Geological Survey land cover maps, beginning in 1970s, recently updated for the continental U.S., is on a 10 year (+/-) update cycle. Pre-publication version has been reviewed by RSL. Land cover is pixel-based and includes various classifications such as categories of developed, barren, forested uplands, cultivated crops, and wetlands. Some categories may reflect Anderson level II categories such as cropland/pasture, deciduous, evergreen and mixed forest lands, etc. Land cover/land use data of this type may fill in some gaps in mapped products where field data is not available.
10. National Wetlands Inventory has currently mapped about 2/3 of quads in this state (??) in the Cowardin system; digitized versions are becoming available. Includes dominant vegetation classes. Contact Doug Cribbs (ESRI, this meeting) for more information.

11. Ducks Unlimited has funded mapping products in the Central Valley and Central Coast areas based on waterfowl issues and includes categories such as emergent wetlands (without species designations?)
12. Chico State College, Geographic Information Center (?) is under contract to Bureau of Reclamation (see Jeff Milliken) to scan old maps and catalog all data from the early 1900s to present involving the Central Valley, Sac. Delta and parts of San Francisco Bay region. Project includes alliance and super alliance levels, cover types, riparian scrub and other categories from the Warner & Kendricks(?) map along about 160 miles of the Sacramento and San Joaquin Rivers; completion time is June 30, 20001.

### **Crosswalks between Systems**

1. Holland types: crosswalks in process for southern California (see Todd Keeler-Wolf, DF&G or Hazel Gordon, RSL) into national system (NVCS), Calveg and WHR but usually involve a one-to-many or many-to-one relationship, which should be prioritized in different areas of the region.
2. WHR has been crosswalked to various classification systems; see Monica Parisi (DF&G) for version 7.0 of WHR
3. Discussion focused on following:
  - a. Super alliance category may facilitate crosswalks between less compatible classification systems
  - b. Crosswalks, like the systems they are derived from, are dynamic and need to be updated or placed in regional contexts such as coastal or desert to be useful; they may be communication tools to facilitate use of new or derived products and should address the hierarchy implicit in each classification scheme
  - c. Crosswalks may use other inputs such as expected (probable) classified vegetation types (NVCS or Calveg types) in different subsections or sections of the state in addition to metadata derived from each map product

### **Plot and Field Data**

1. Forest Inventory and Analysis (inventory) plots are available for all national forests(NF) and non-NF lands in California and for different time periods from the early 1990s; see Ralph Warbington (RSL) for details. Plot data is suitable for classification of vegetation types if map condition (eg., life form) within a plot is homogeneous. Methodology will be changing in next few years to one plot per 6000 acres from one in 7400 acres previously (or less in rare types) and to hexagonal cluster plot pattern from the standard circular cluster plot method. NF plots are appropriately georeferenced, but non-NF lands are not due to issues of privacy. Currently, about 8000 plots are available for NF and about 4000 for non-NF lands. Software to run reports, statistics and the like are available from Ralph and the inventory group at RSL.
2. Ecology plot data from the USFS Region 5 Ecology group: possibly 8000 plots have been georeferenced, with others also available having more general locations available. See Bruce Bingham (USFS, Terra group in Sandy, OR), or Todd for this source. Data may be over 10 years old in some cases.
3. Weislander plot data used to produce the maps: possibly some 15,000 plots are available from 1930s data. Georeferencing is a problem, but Mike Barbour (UC Davis) and Rich Minnich (UC Riverside) have relocated some of these on the Angeles and San Bernardino NFs.

4. Calif. Native Plant Society data: about 3200 plots are available from releve plots and 50 m transect methods; 2000 are in the desert areas alone
5. Timberland Task Force contracted for mapping of the Klamath Province area (nw Calif.) has several hundred plots available from 1991 or 1992 data capture; see RSL (Brian Schwind or Hazel Gordon) for these.
6. Older inventory plots used in old growth studies on NFs; some 5000 plots produced from stratified random sampling methods; see Ralph Warbington or Brian Schwind at RSL.
7. Bureau of Land Management plots: over one thousand "toe point" transects from the 1970s and 1980s used especially in desert rangeland studies in the Mojave, are available; see Todd (DF&G) for details (species and environmental variables are entered in spreadsheets)
8. Bureau of Reclamation: some plot data is available along the lower Colorado River; see Jeff Milliken (BOR) for information
9. National Park Service: several hundred Natural Resource Inventory Plots exist for Yosemite (360), and Sequoia Kings Canyon (640). Other parks may have them as well. All of these are digital and taken between 1990 and 1996.

#### **Imagery and Auxiliary Visual Data Sources**

- Change detection data from 1990s: available from RSL
- Spot Imagery available for 1993; also for 1996 in the southern Sierras; 1998-2000 spot imagery (in process) at 10 meter resolution; see Brian Schwind at RSL
- IRS imagery (10 meter resolution) for 1997 or 1998 is available for the Central Valley, Klamath Province, northeastern Calif. to southern Sierras; see Brian Schwind
- Thematic Mapping imagery for 1993 is available from Jeff Milliken as part of Ducks Unlimited projects in the Central Valley
- National Aerial Applications Photos area available at 1:40,000 black and white images for 1993 in certain areas; some are available from 1998 in northern California; see Ralph for details
- Colored aerial photos are available for the state from 1986 air flights at scale of 1:60,000; basic NF scale of 1:15,840 photos are available at various NFs; see Brian Schwind for details
- Scanned aerial photos from 1997 are available in digital form for the lower Colorado River area; see Jeff Milliken in addition to one meter resolution digital images from same region
- Entire Mojave Desert Ecoregion flown at 1:32,000 true color in June 1997. Diapositives and contact prints archived at USGS Biological Resources Division Colorado Plateau Field Office, Flagstaff AZ (contact is Kathryn Thomas).
- Landsat is flown frequently over the lower Colorado River – Coachella Valley and Imperial Counties area – see Jeff for details
- Digital Elevation Models (DEMs) are available statewide at 30 meter resolution and more recently available at 10 meter resolution, a resampling of old data sets; see Brian Schwind for details
- Digital Ortho Quads (DOQs) are available for about ¾ of the state based on 1993-94 NAAP photos; color DOQs are available for parts of southern Calif. for 1996 and possibly for 1998; these are public domain items available through USGS

- Calif. Dept. of Water Resources (DWR) maintains a digital, scanned aerial photos set from the mid 1990s to the present for Central Valley water projects and adjacent areas in Eldorado County; see Mark Rosenberg (Calif. Dept. of Forestry and Fire Protection) for details
- Calif. Dept. of Parks and Recreation has contracted with DWR for 1:6,000 and 1:12,000 photos to be flown for their alliance and association vegetation state parks maps; see Cyndi Royce (Calif. Parks and Recr.) for details
- Southern California Association of Governments is about to purchase new digital imagery at one and two meter resolutions for a large area of southern Calif.; see Mark Rosenberg (CDF) for details.
- Historical aerial photos from the 1930s and 1940s are available for the Central Valley; see Jeff for details
- Conclusions:
- Imagery needs focus on acquiring high-resolution aerial photo sources, not satellite derived images because of cost factors, the latter being less expensive to acquire. Coordination should be done with partnerships and cost sharing arrangements for these purchases.

### **General Discussion**

Question: what is the role of the Memorandum of Understanding and reports thereof?

Answers:

1. It gives minimum specification for “standards” which will evolve to a statewide (corporate) database to eliminate overlapping products and lack of common standards to which products should adhere
2. It will provide the opportunity to have a “seamless cover” at a mesoscale level, probably at plant alliance hierarchy. Provides setting for a document of implementation to show that resource assessment needs can be addressed in a coordinated way.

Question: how are specifics (details) addressed in these MOU products?

Answer: A minimum of jargon will be used in the general text format but about 5 pages of appendices will handle technical details as the MOU progresses into specifics of projects

Question: why is historical data of interest?

Answer: Used in trend analysis but focus on contemporary issues (1990s forward) without scattering efforts

Question: how are partnership arrangements made?

Answers:

1. Begin with agency’s priorities and current schedules, eg., BOR’s projects in the Central Valley may involve its working with CDF and possibly DF&G since these opportunities for partnerships currently exist
2. After identification of existing data, gaps may be found and appropriate agency may schedule its workload to address data needs and partnerships to complete the gaps
3. Since land cover/landuse classifications are especially pertinent for agricultural and development uses, standards need to be set for these categories in addition to traditional natural vegetation types; opportunities may exist for agencies to develop these standards in partnership arrangements

4. In a multi-scale, multi-classification hierarchy, these needs should be addressed by appropriate agency with such expertise (eg., land cover)
5. When five-year monitoring cycle is part of this package, mapping gaps can be filled in with appropriate partnerships

Question: shall a subgroup develop these agricultural and other non-native vegetation standards?

Answers:

1. Anderson levels I and II should be examined for land use categories, but land cover categories may be potential and not existing uses of the land; question whether DWR riparian categories distinguish natural from man-caused vegetation
2. Use existing data in Central Valley projects such as Ducks Unlimited categories or DWR ; these should be examined in but deficiencies should be addressed in that product

Question: how to define Best Mapping Products (BMP) for initial use in project or to evaluate duplicate products; how do we define standards in their use?

Answers:

1. Does map/project cover entire region of interest?
2. Is product relatively recent (1990s or later)?
3. Is product floristically based?
4. Is minimum mapping unit reasonable in the range from 1 ha (2 ½ acres) to 100 ha (250 acres)?
5. Is there appropriate metadata for the product?
6. Is there a catalog or web-based source that lists available data for this area?
7. If there is no other data, is the GAP product appropriate and accurate for this area

## ***Outreach, Storage, Dispersion, and Updating Information Subgroup***

Participants: Mark Rosenberg, Carrie Shaw

### **Must determine who we need to coordinate with at local, state, and national levels**

1. How do we do this coordination?
  - First Step: Make contacts, solicit participation
  - Identify potential collaborators (as a group)
  - Develop publications, pamphlets, mailers, Biodiversity newsletter
  - Develop website- must be regularly updated
  - Presentations, meetings; Annual California vegetation Classification mapping colloquium (moves around state or same place each year?)
2. Project outreach:
  - California Biodiversity Council meeting (make vegetation a CBC meeting theme)
  - Produce Hardcopy maps, classifications, descriptions of vegetation, summary statistics

### **Storing and Accessing Existing Data**

1. Storage
  - Requires Disk space and staffing
  - Determine the virtues of centralized versus distributed (Distributed is better)
  - Data producers should distribute because they can monitor uses (is it appropriate) Also can send most current data
2. Statewide survey should be central: one group doing mapping/distribution versus multiple groups
3. Storing  
Recommendations:
  - Multiple funding sources 2-3 entities (state & federal) do mapping, storing, disseminating and updating
  - CDF and USFS (5 areas)
  - BOR/DWR – Central Valley
  - BRD/BLM/DFG Deserts
  - Use contractor or staff to pull together statewide data:
  - Distribute through web from one or more locations (producers, centralized, etc.)
  - Need file structure to disseminate
  - Hardcopy/softcopy map product
4. Web based tools for managing, disseminating and updating the vegetation data statewide.
5. Website will have (build onto CBC webpage hierarchically CBC>SCC>Veg Team):
  - Classification scheme/descriptions
  - Project list – current/planned projects:
  - Vegetation catalog
  - Description of MOU and Vegetation Theme team
  - Minutes from meetings:
  - Announcements:
  - Participants and contact information



- Access to the data/metadata
- Access to draft maps
- Tools to identify updates needed
- Map-making tool:
- Map products and summary statistics

#### 6. Shared Imagery:

- Coordinate with remote sensing theme team
- Catalog of imagery available/used:
- Different scales owners, extents, etc.

#### 7. Updating

Change-detection using reasonable method and rate:

- 5 year cycle:
- 2-3 groups doing work – not more?
- Not repeat mapping wall-to-wall – use change detection methods minimize additional work and redundancy